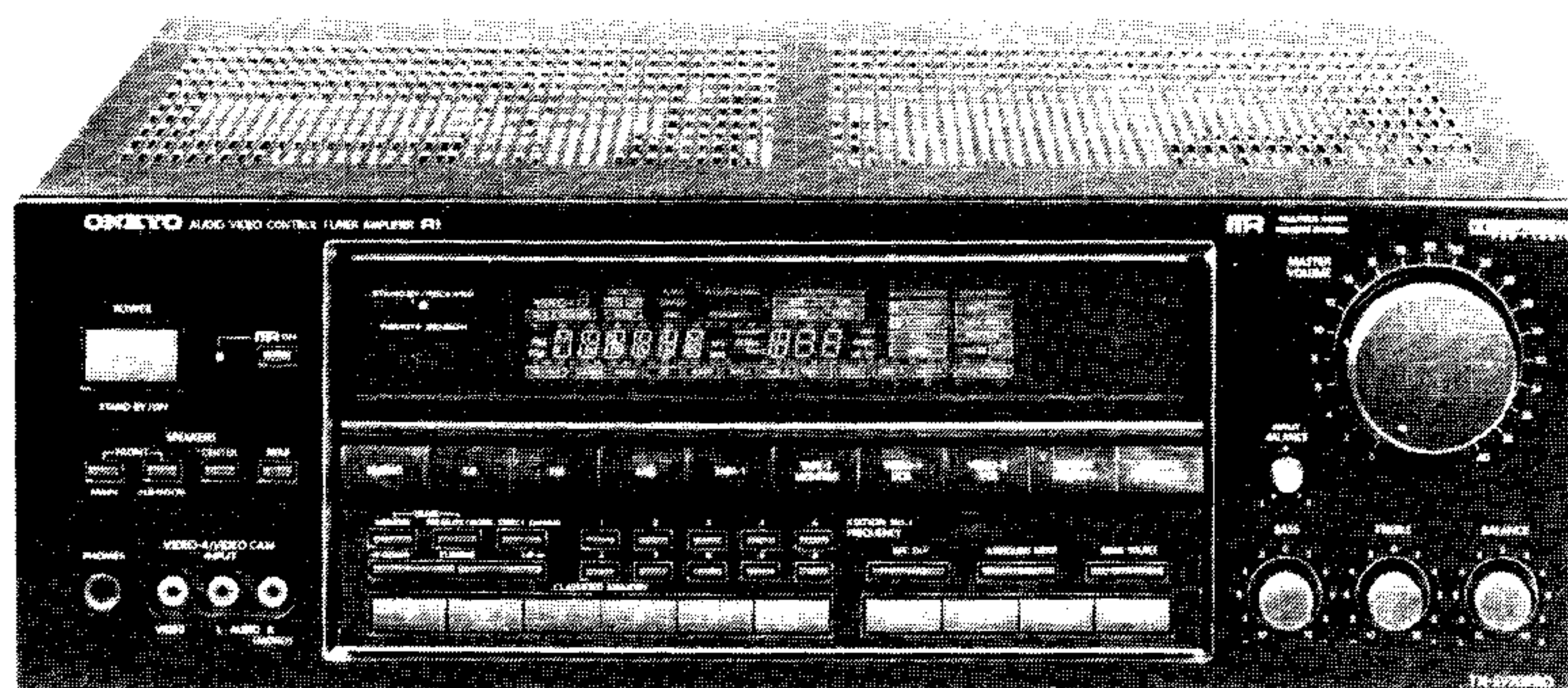



ONKYO® SERVICE MANUAL

AUDIO VIDEO CONTROL TUNER AMPLIFIER MODEL TX-SV70PRO



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

AMPLIFIER SECTION

Power Output:	<p>Stereo mode 90 watts per channel min. RMS. at 8 ohms, both channels driven, from 20Hz to 20,000Hz, with no more than 0.06% total harmonic distortion.</p> <p>Surround mode 85 watts per channel min. RMS. at 8 ohms both channels driven, from 20Hz to 20,000Hz, with no more than 0.06% total harmonic distortion.</p> <p>(FRONT/CENTER Matrix surround mode) 30 watts per channel min. RMS. at 8 ohms 1,000Hz with no more than 0.08% total harmonic distortion. (REAR Matrix surround mode)</p>
Total Harmonic Distortion:	0.06% at rated power (FRONT)
IM distortion:	0.06% at rated power (FRONT)
Damping Factor:	70 at 8 ohms (FRONT)
Sensitivity and Impedance:	<p>Phono: 2.5mV/50 kohms</p> <p>CD/Tape Play: 150mV/50 kohms</p> <p>Tape Rec: 150mV/2.2 kohms (Phono)</p> <p>Pre out (FRONT): 1V, 2.2 kohms</p> <p>Pre out (REAR/CENTER): 1V, 2.2 kohms</p> <p>Mono out (SUB WOOFER): 1V, 2.2 kohms</p>
Phono Overload:	120mV RMS, at 1,000 Hz, 0.06% THD.
Frequency Response:	20 to 30,000 Hz, ± 1 dB VIDEO IN \rightarrow DOLBY PRO LOGIC \rightarrow SURROUND \rightarrow REAR PRE OUT: 30 to 7 kHz, ± 0 dB, -3 dB
RIAA Deviation:	20 to 20,000 Hz, ± 0.8 dB
Tone Control:	<p>BASS: ± 10 dB at 100 Hz</p> <p>TREBLE: ± 10 dB at 10,000 Hz</p>
Signal to Noise Ratio:	<p>PHONO: 80 dB (IHF A, 5mV input)</p> <p>CD/TAPE: 100 dB (IHF A)</p>
Muting:	$-\infty$

TUNER SECTION

FM:	
Tuning Range:	87.50 – 108.00 MHz (50 kHz steps)
Usable Sensitivity:	<p>Mono: 11.2 dBf, 2.0μV</p> <p>Stereo: 17.2 dBf, 4.0μV</p>
50dB Quieting Sensitivity:	<p>Mono: 17.2 dBf, 4.0μV</p> <p>Stereo: 37.2 dBf, 40 μV</p>
Capture Ratio:	1.5 dB
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	90 dB
Signal-to-Noise Ratio:	<p>Mono: 76 dB</p> <p>Stereo: 70 dB</p>
Alternate Channel Attenuation:	55 dB
AM suppression Ratio:	50 dB
Harmonic Distortion:	<p>Mono: 0.1%</p> <p>Stereo: 0.2%</p>
Frequency Response:	30 – 15,000 Hz ± 1.0 dB
Stereo Separation:	<p>45 dB at 1kHz</p> <p>30 dB at 100 – 10,000Hz</p>
Muting Level:	17.2 dBf
AM:	
Tuning Range:	530 – 1710 kHz (10 kHz steps)
Usable Sensitivity:	30 μ V
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	40 dB
Signal-to-Noise Ratio:	40 dB
Harmonic Distortion:	0.7%

GENERAL

Power Supply:	AC120V, 60Hz
Dimensions (W×H×D):	435×157×432 mm 17-1/8"×6-3/16"×17"
Weight:	14.0kg., 30.9 lbs.

REMOTE CONTROL TRANSMITTER RC-AV70M

Transmitter:	Infrared
Signal Range:	Approx. 5 meters (16ft. 4")
Power Supply:	Two "AA" batteries (1.5V×2)

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

1. Replacing the fuses

For continued protection against fire hazard, replace only with same type and same rating fuse.

Circuit No.	Part No.	Description
F901	252053	8A (ST-6), Primary
F903, F904	252051	6A (ST-6), Secondary

2. Change of AM band selector

A AM BAND step selector switch is not provided.

Band step	D716 (ISS133)
10kHz → 9kHz	Additional
9kHz → 10kHz	Eliminated

The diode D716 is on the display PC board. (Refer to the page 23)

3. Memory preservation

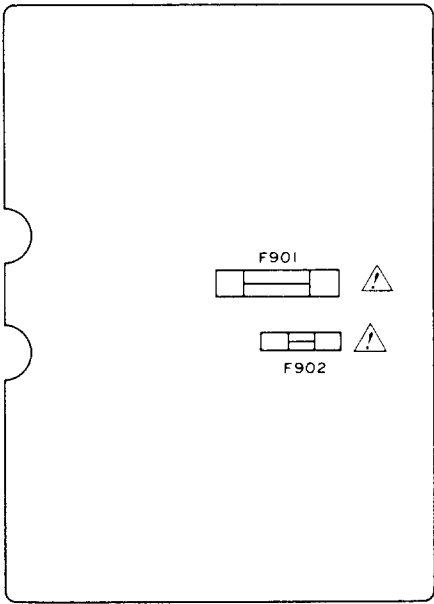
This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

4. Safety-check out

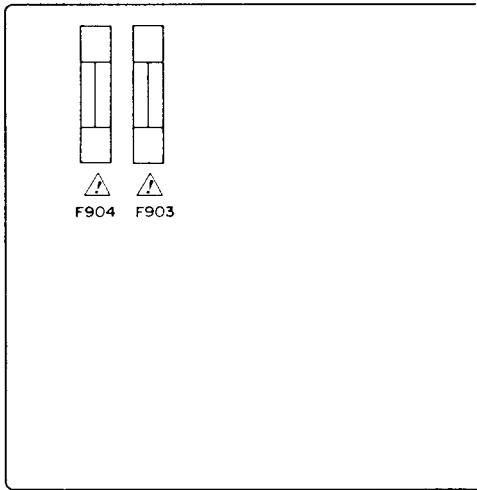
(Only U.S.A. model)

After correcting the original service problem perform the following safety check before releasing the set to the customer.

Connect the insulating-resistance tester between the plug of power supply cord and terminal GND on the back panel. Specifications: 3.3 Mohm ±10% at 500V.

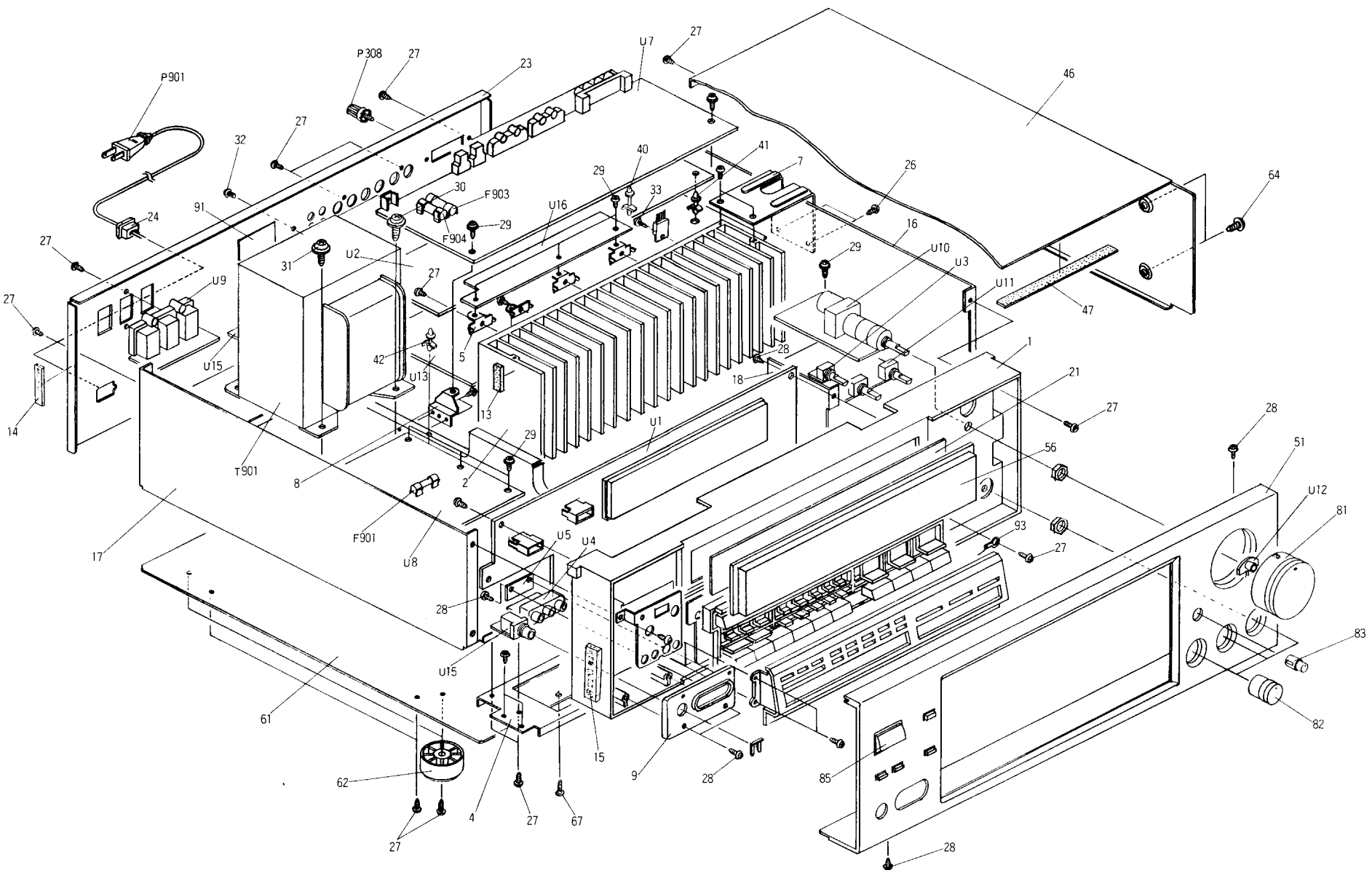


Power supply circuit pc board



Tuner circuit pc board

CHASSIS-EXPLODED VIEW

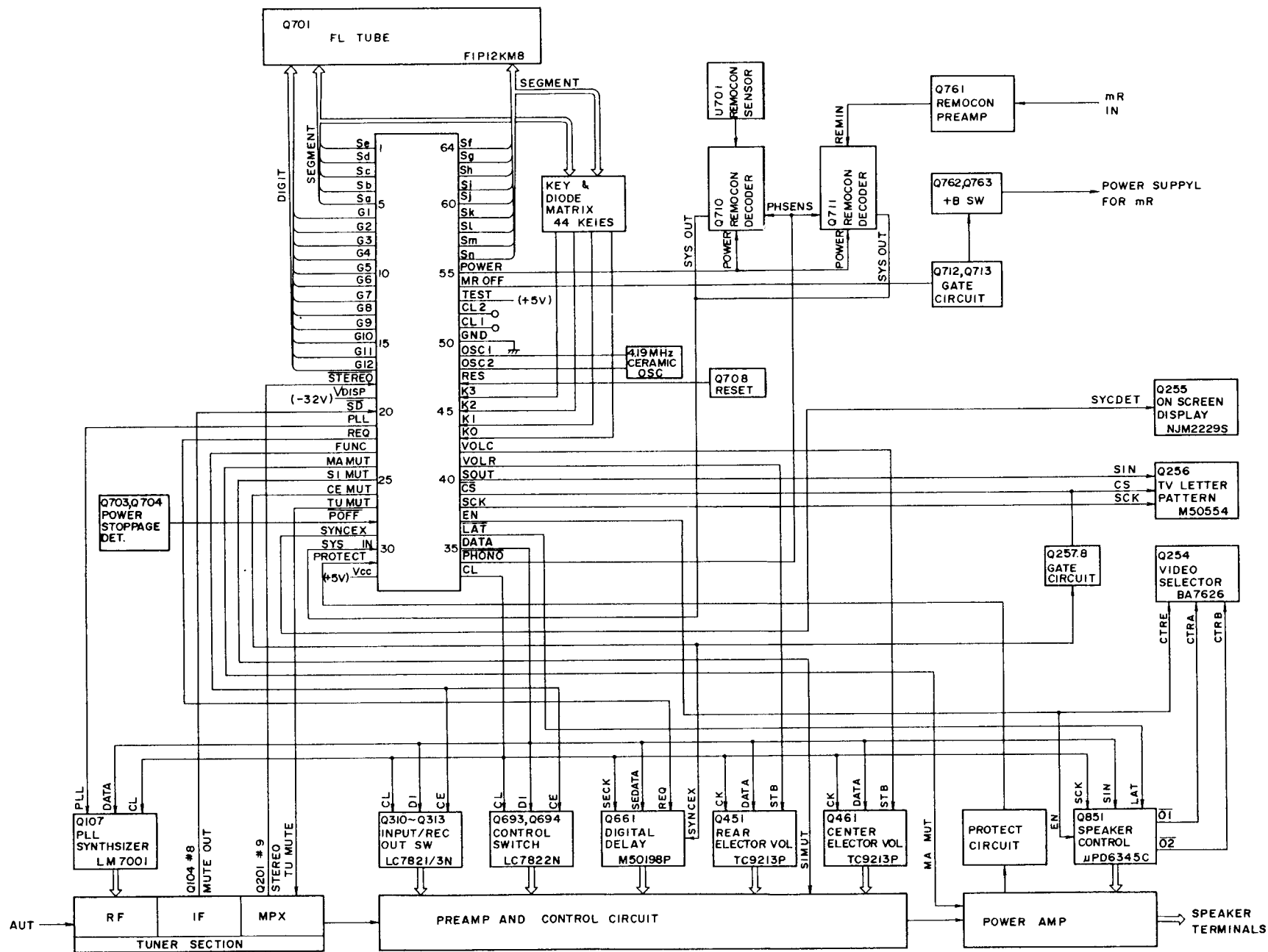


CHASSIS-EXPLODED VIEW – PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	27110585A	Front bracket	F901	252053	⚠ 8A (ST-6), Primary fuse
2	27160261	Radiator	F903, F904	252051	⚠ 6A (ST-6), Secondary fuse
4	27130628	Bracket H	P308	25060044	Terminal GND
5	27141359	Bracket H	P901	253123,	
7	27141322	Bracket R		253136,	
8	27141360	Bracket B		253140,	
9	27190782	Holder PIN		253146 or	
13	28140927	t2×30×10, Cushion		253161	⚠ AS-UC6#18, Power supply cord
14	28140933	t3× 7×55, Cushion	T 901	2300589	⚠ NPT-1080D, Power transformer
15	28141086	Cushion	U1	1A233565-1	NADIS-3965-1, Display circuit
16	27115240-1	Side bracket			pc board ass'y
17	27130564D	Bracket PT	U2	1A233566-1	NAAF-3966-1, Surround circuit
18	27130621	Bracket F			pc board ass'y
21	28133248	Back plate	U3	1A233567-1	NAETC-3967-1, Input balance
23	27121377A	Back panel			volume pc board ass'y
24	27300750	⚠ Bushing	U4	1A233568-1	NAETC-3968-1, Video terminal
27	834430088	3TTS+8B (BC), Self-tapping screw			pc board ass'y
28	833430080	3TTP+8P (BC), Self-tapping screw	U5	1A233569-1	NAETC-3969-1, Pc board for video
29	831130088	3TTW+8B, Self-tapping screw			pc board hold
30	830440089	4TTC+8C (BC), Self-tapping screw	U7	1A233570-1	NARF-3970-1, Tuner circuit
31	838440109	4TTB+ 10C (BC), Self-tapping screw			pc board ass'y
32	82143006	3P+6FN (BC), Pan head screw	U8	1A233571-1	NAPS-3971-1, Power supply circuit
33	801433	3SMS8W-SW+14B (BC), Sems self-tapping screw	U9	1A233572-1	NAETC-3972-1, AC outlet terminal
40	27190369	KGLS-22S, Holder	U10	1A233573-1	pc board ass'y
41	27190783	KGLS-11S, Holder			NAAF-3973-1, Master volume
42	27190693	KGLS-6R, Holder	U11	1A233574-1	pc board ass'y
46	28184463A	Top cover			NAAF-3974-1, Tone control
47	28140835	t0.5×10×135, Cushion	U12	1A233575-1	pc board ass'y
51	1A233121	Front panel ass'y			NADIS-3975-1, Volume indicator
56	28191576	Clear plate	U13	1A233576-1	pc board ass'y
61	27170254C	Bottom board			NAAF-3976-1, Pre., and main
62	27175153-1	Leg	U14	1A233577-1	amplifier pc board ass'y
64	838440089	4TTB+8C (BC), Self-tapping screw			NAETC-3977-1, Speaker terminal
67	834430108	3TTS+10B (BC), Self-tapping screw	U15	1A233578-1	pc board ass'y
81	28323558	Knob VOLUME			NAETC-3978-1, Headphone
82	28323310A	Knob TONE	U16	1A233579-1	terminal pc board ass'y
83	28323671A	Knob VOLUME			NAAF-3979-1, Rear
85	28324072	Knob POWER			amplifier pc board ass'y
91	29360626-1	Label FUSE			
92	260215	Binder			
93	2061112060	Terminal ass'y			

NOTE:
THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE
CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK.
REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

MICROPROCESSOR DESCRIPTIONS



Q702
HD404729A86 (Microprocessor)
Terminal Description

Pin no.	Symbol	Description
1	Se	Segment output terminals.Active H.
2	Sd	
3	Sc	
4	Sb	
5	Sa	Digit and Key scan output terminals.Active H.
6	G1	
7	G2	
8	G3	
9	G4	
10	G5	
11	G6	
12	G7	
13	G8	
14	G9	
15	G10	
16	G11	
17	G12	
18	STEREO	Stereo broadcast discrimination input terminal.Active L. Control to the indicator STEREO.
19	Vdisp	Power supply terminal for pull-down resistor.
20	SD	Broadcast discrimination input terminal.Active L.
21	PLL	Connect to the terminal CE of PLL IC (LM7001). Active H.
22	REQ	Connect to the terminal REQ of delay IC(M50198P).Active H.
23	FUNC	Connect to the terminal CE of analog switches.(LC7821N, LC7822N and LC7823N) Active H.
24	MAMUT	Audio main muting output terminal.Active H.
25	SIMUT	Audio simulative muting output terminal.Active H.
26	CEMUT	Muting output terminal for the chip select terminal of the control ICs(Data extended IC,PLL IC,and Delay IC).Active H.
27	TUMUT	Tuner muting output terminal.Active H.
28	POFF	Stoppage detection input terminal.Active L.
29	SYNCEX	External/Internal changeover input terminal of synchronizing signal of on screen display.
30	SYS IN	System code input terminal.Active H.
31	PROTECT	Protection circuit discrimination input terminal.H when the protection circuit operates.
32	Vcc	Power supply terminal.

Pin No.	Symbol	Description
33	CL	Clock pulse output terminal.Connect to the terminal CL of PLL IC, the terminal CE of analog switches,the terminal SECK of delay IC, the terminal CK of the electro volume,and the terminal SCK of data extended IC.
34	PHONO	Phono control output terminal.L when the selector switch is PHONO.
35	DATA	Data output terminal.Connect to the terminal DATA of PLL IC,the terminal DI of analog switches,the terminal SEDATA of delay IC ,the terminal DATA of electro volume,and the terminal SIN of data extended IC.
36	LAT	Connect to the terminal LAT of the data extended IC.
37	EN	Connect to the terminal EN of the data extended IC.
38	SCK	Connect to the terminal SCK of the on screen display IC.
39	CS	Connect to the terminal CS of the on screen display IC.
40	SOUT	Connect to the terminal SIN of the on screen display IC.
41	VOLR	Connect to the terminal STB of the electro volume IC for rear and simul.
42	VOLC	Connect to the terminal STB of the electro volume IC for center.
43	K0	Key matrix input terminals.Active H.
44	K1	
45	K2	
46	K3	Key matrix input terminals.Active H.
47	RES	Reset input terminal.Active H.
48	OSC2	Main system clock input terminal.
49	OSC1	Connect to the ceramic oscillator of 4.19MHz.
50	GND	Ground terminal.
51	CL1	Sub clock input terminal.Not used.
52	CL2	Sub clock input terminal.Not used.
53	TEST	Test terminal.
54	MR OFF	Multi-room remote control ON/OFF control output terminal.Active L.
55	POWER	Power control output terminal.H when the power turns on.
56	Sn	Segment output terminals.Active H.
57	Sm	
58	Sl	
59	Sk	
60	Sj	
61	Si	
62	Sh	
63	Sg	
64	Sf	

ADJUSTMENT PROCEDURES

• Preparation

1. Input

FM mono: 1kHz, 75kHz devi., 60dB/ μ V

FM stereo: 1kHz, 75kHz devi., 60dB/ μ V

Pilot signal 19kHz 7.5kHz devi.

AM: 400Hz 30% mod.

2. Outputs

Connect the non-inductive type resistors of 8ohms to the main speaker, subroom speaker, center speaker, and rear speaker terminals unless otherwise noted.

3. Standard Knob Position

TAPE MONITOR 1/2 OFF

VOLUME Maximum

BASS/TREBLE/BALANCE/INPUT

BALANCE Center

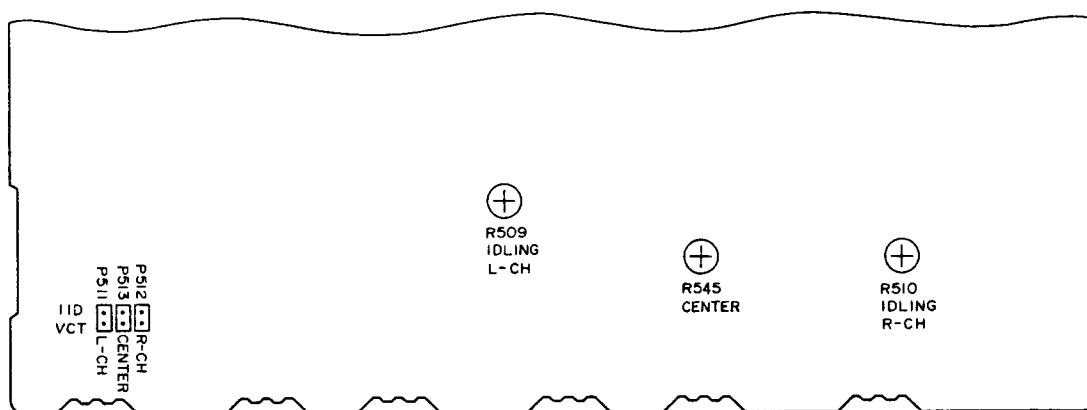
MUTING/LOUDNESS Off

REC SELECTOR SOURCE

INPUT SELECTOR CD

SPEAKERS ON

S.T.C. OFF



PRE., AND MAIN PC BOARD

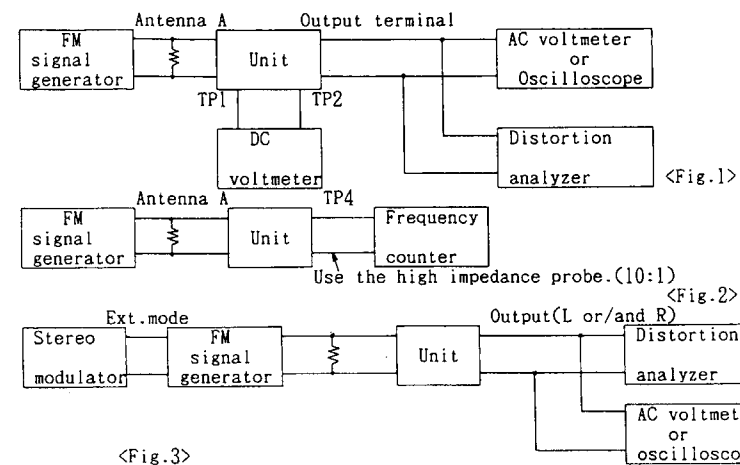
Amplifier section

Idling Current Adjustment

Connect the DC voltmeter to the terminals IID and VCT on the pre., and main amplifier pc board. Adjust the semi-fixed resistors R509, R510, and R545 so that the indication of voltmeter is 5 ± 0.5 mV.

Section

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
	1	Fig. 1	99.1MHz 1kHz, 75kHz devi. 65dBf (60dB)		99.1MHz	DC voltmeter	L101	$0 \pm 20\text{mV}$	FM MUTE/MODE switch: ON/STEREO Repeat the steps 1 and 3 until no further adjustment is necessary.
	2					AC voltmeter	IFT on the front end	Maximum	
	3					Distortion analyzer	L102	Minimum	
		Fig. 2	99.1MHz 1kHz, 75kHz devi. 65dBf (60dB)		99.1MHz	Frequency counter	R201	$19\text{kHz} \pm 10\text{Hz}$	
ation		Fig. 3	99.1MHz, Ext mod., 65dBf (60dB)	Channel L or R 1kHz	99.1MHz	Distortion analyzer	IFT on the front end	Minimum	Don't turn more than $\pm 180^\circ$
ation	1	Fig. 3	99.1MHz Ext. modulation 65dBf (60dB)	Channel L 1kHz	99.1MHz	Channel R AC voltmeter	R202	Minimum	Maximum and same separation.
	2			Channel R 1kHz		Channel L AC voltmeter		Minimum	
g		Fig. 3	99.1MHz 17.2dBf (12dB)		99.1MHz	TUNING indicator	R101	Light on	

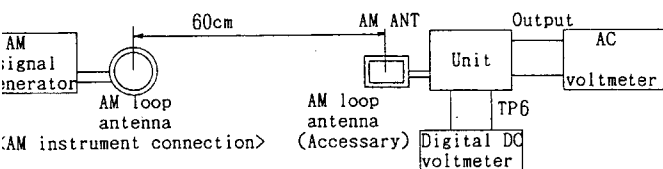


Section

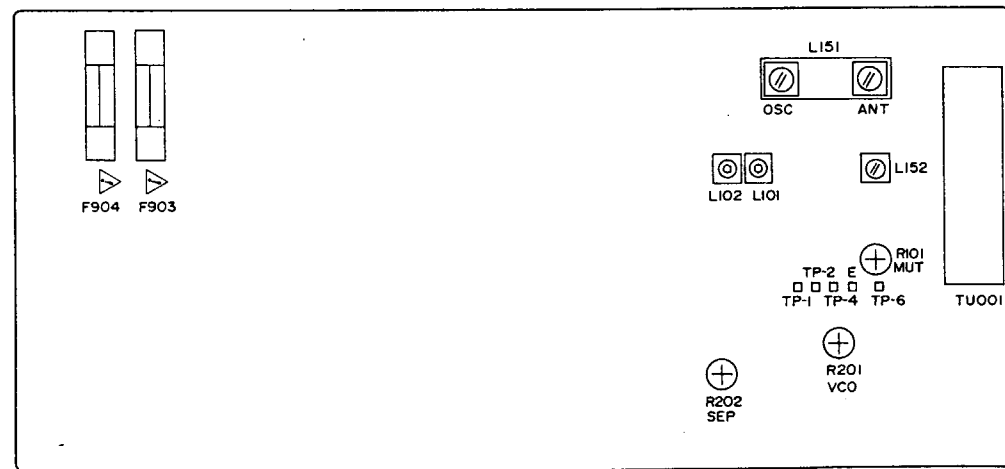
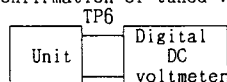
AM SG output	Tuning frequency	Output indicator	Adjustment point	Adjust for
	530kHz	Digital DC voltmeter	OSC coil on RF block	$1.5 \pm 0.1\text{V}$
600kHz 400Hz, 30% mod. 60dB/m	600kHz	AC voltmeter	ANT coil on RF block	Maximum
990kHz 400Hz, 30% mod. 60dB/m	990kHz	AC voltmeter	L152	Maximum

Reference Specifications

FM tuned voltage: 87.5MHz ~ 108.00MHz
 $1.6 \pm 0.4\text{V} - 7.9 \pm 0.4\text{V}$
 AM tuned voltage: 530kHz $1.3 \pm 0.5\text{V}$
 1710kHz $7.2 \pm 0.5\text{V}$
 Auto stop level: AM: Less than 62dB/m
 FM: Less than 17dB/ μ



Confirmation of tuned voltage



DISPLAY CIRCUIT PC BOARD (NADIS-3965-1)

CIRCUIT NO. PART NO. DESCRIPTION

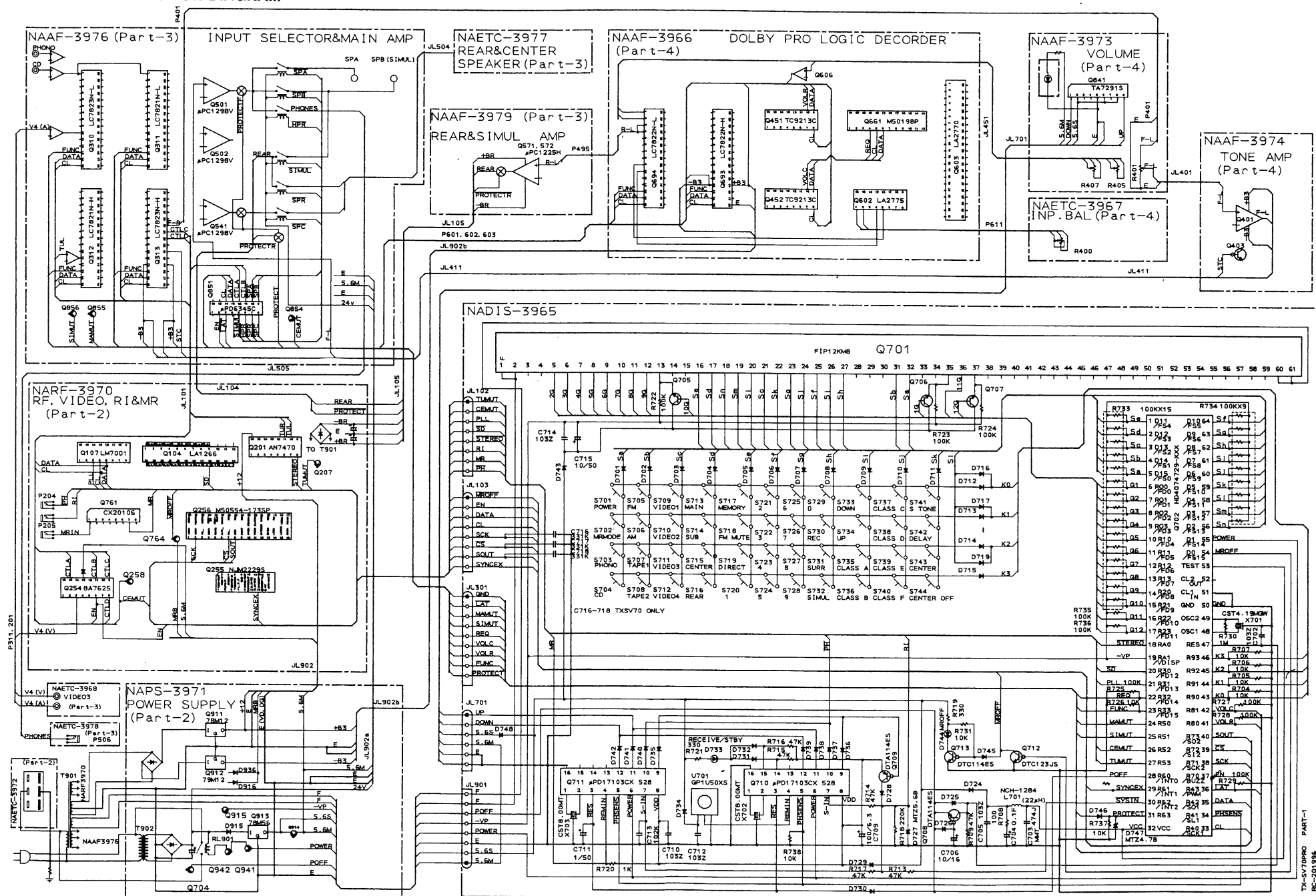
Remocon sensor		
U701	24130003	GPIU50XS
ICs		
Q702	22240378	HD404729A86
Q710, Q711	22240376	μ PD17103CX-528
FL tube		
Q701	212088	FIP12KM8
Transistors		
Q705-Q707	2213284	2SC1740S-R
Q708, Q709	2213510	DTA114ES
Q712	2213640	DTC123JS
Q713	2213290	DTC114ES
Diodes		
D701-D715	223163	1SS133
D719, D748	223163	1SS133
D724-D726	223163	1SS133
D727	224450562	MTZ5.6B, Zener
D728-D732	223163	1SS133
D734-D743	223163	1SS133
D745, D746	223163	1SS133
D747	224450472	MTZ4.7B, Zener

CIRCUIT NO. PART NO. DESCRIPTION

L.E.Ds		
D733, D744	225141	SEL2213C
Ceramic oscs		
X701	3010163	CST4.19MGW
X702, X703	3010154	CST8.00MT
Coil		
L701	233409K220	NCH-1284
Capacitors		
C703	375524744	0.47 μ F, 5%, 50V, Plastic (MMT)
C704	3000057	0.1F, 5.5V, Super
C706	353741009	10 μ F, 16V, Elect.
C709	353721019	100 μ F, 6.3V, Elect.
C711, C715	353780109	1 μ F, 50V, Elect.
Resistors		
R733	49163104415	100k \times 15, 1/10W, Network
R734	49163104409	100k \times 9, 1/10W, Network
Switches		
S701-S744	25035548	NPS-111-S510
Holders		
Q701a	27190784	FL tube
D733a	27190549	Stand-by
D744a	27190517A	MR Off

SCHEMATIC DIAGRAM

MICROPROCESSOR CONNECTION DIAGRAM



ER CIRCUIT AND POWER SUPPLY SECTION



PRINTED CIRCUIT BOARD PARTS LIST

TX-SV70PRO

TUNER CIRCUIT PC BOARD (NARF-3970-1)

CIRCUIT NO. PART NO. DESCRIPTION

Front End

TU001 240088 FE337-A07

ICs

Q104 22240039 LA1266
Q107 22240090 LM7001
Q201 22240242 AN7470
Q254 22240373 BA7625
Q255 22240374 NJM2229S
Q256 22240299 M50554-173SP
Q761 22240345 CX20106A
Q762 222780053 78L05

Transistors

Q102 2211723 2SC1923-O
Q103, Q106 2211183 or 2SC1740-R or
Q259 2211255 2SC1815-GR
Q105 2212445 2SK365-GR, FET
Q108, Q109 2213510 DTA114ES
Q205, Q206 2212794 2SD1468-R
Q207 2213510 DTA114ES
Q251-Q253 2213074 or 2SA933-R or
2211455 2SA1015-GR
Q257 2213510 DTA114ES
Q258 221282 DTC144ES
Q260, Q261 2213640 DTC123JS
Q763 2213830 DTB113ZS
Q764 221282 DTC144ES

Diodes

D101, D102 223132 1K60, Germanium
D103 224450512 MTZ5.1B, Zener
D201-D204 223163 1SS133
D251-D255 223163 1SS133
D257 224450512 MTZ5.1B, Zener
D762-D764 223163 1SS133
D902 22380022 RBV402
D903, D904 223163 1SS133

Transformers

L101 233401 NFIF-4072
L102 233402 NFIF-4073
L152 232139 NMIF-4062

Coils

L103 233409M022 NCH-1272
L151 232148 NMRF-7050
L201, L202 233355A NMC-4059
L251-L253 233409K270 NCH-1285
L254 233409K101 NCH-1292
L571, L572 231176 S-1.3C

Ceramic Filters

X101, X103 3010071 SFE10.7MA5
X151 3010123 SFZ450JL
X152 3010076 BFU450C

Oscillator elements

X104 3010141 XTL-7.2M, X'tal
X251 3010168 CSB503F2, Ceramic
X252 3010167 XTL-14.32M, X'tal


Capacitors

C001, C108 354741019 100 μ F, 16V, Elect.
C106 354784799 0.47 μ F, 50V, Elect.




CIRCUIT NO.	PART NO.	DESCRIPTION
C107	354742209	22 μ F, 16V, Elect.
C112	354780229	2.2 μ F, 50V, Elect.
C113	354784799	0.47 μ F, 50V, Elect.
C116	374722234	0.022 μ F, 5%, 50V, TF
C117	374723334	0.033 μ F, 5%, 50V, TF
C118	354780229	2.2 μ F, 50V, Elect.
C119, C161	354782299	0.22 μ F, 50V, Elect.
C123	354721019	100 μ F, 6.3V, Elect.
C154	354780479	4.7 μ F, 50V, Elect.
C155-C157	354741009	10 μ F, 16V, Elect.
C159	374724734	0.047 μ F, 5%, 50V, TF
C160	374721034	0.01 μ F, 5%, 50V, TF
C201	354744719	470 μ F, 16V, Elect.
C202	354742209	22 μ F, 16V, Elect.
C205	354782299	0.22 μ F, 50V, Elect.
C206	354780109	1 μ F, 50V, Elect.
C207	354780339	3.3 μ F, 50V, Elect.
C208	370134714	470pF, 5%, 100V, APS
C209	374724734	0.047 μ F, 5%, 50V, TF
C211, C212	374721824	1800pF, 5%, 50V, TF
C213, C214	354742209	22 μ F, 16V, Elect.
C215, C216	354741009	10 μ F, 16V, Elect.
C219, C220	374726224	6200pF, 5%, 50V, TF
C222	354780229	2.2 μ F, 50V, Elect.
C223	374721024	1000pF, 5%, 50V, TF
C224	374724734	0.047 μ F, 5%, 50V, TF
C251-C254	354741009	10 μ F, 16V, Elect.
C255-C257	354724719	470 μ F, 6.3V, Elect.
C258, C259	354721019	100 μ F, 6.3V, Elect.
C262	374726834	0.068 μ F, 5%, 50V, TF
C263	354780109	1 μ F, 50V, Elect.
C268	354721019	100 μ F, 6.3V, Elect.
C269	354780339	3.3 μ F, 50V, Elect.
C270, C271	354780109	1 μ F, 50V, Elect.
C272	374723924	3900pF, 5%, 50V, TF
C273	354741009	10 μ F, 16V, Elect.
C274	354780109	1 μ F, 50V, Elect.
C279, C283	374721034	0.01, 5%, 50V, TF
C284, C287	354721019	100 μ F, 6.3V, Elect.
C290	354741009	10 μ F, 16V, Elect.
C591, C592	374724734	0.047 μ F, 5%, 50V, TF
C762	354780229	2.2 μ F, 50V, Elect.
C763	354780109	1 μ F, 50V, Elect.
C764	354780339	3.3 μ F, 50V, Elect.
C766	354721019	100 μ F, 6.3V, Elect.
C767	354741009	10 μ F, 16V, Elect.
C907, C908	3504207	6800 μ F, 50V, Elect.
Resistors		
R101	5210221 or 5210070	N06HR100KBD, Semi-fixed
R201	5210216 or 5210062	N06HR5KBD or N06HR4.7KBD, Semi-fixed
R202	5210072 or 5210222	N06HR220KBC or N06HR200KBD, Semi-fixed
R595, R596	442520824	8.2ohm, 1/2W, Metal oxide film
Terminal		
P101	25060085	NTM-4PDMN29, Antenna
Sockets		
P201	2009990021A	NSAS-4P0045
JL101	25050273	NSCT-9P101
JL102, JL103	25050272	NSCT-8P100
JL104, JL105	25050270	NSCT-6P98
JL903	25050270	NSCT-6P98




CIRCUIT NO.	PART NO.	DESCRIPTION
Jacks		
P202, P203	25045299	NPJ-3PDYE158
P204	25045172	HSJ-1003-01-020, RI
P205	25045293	HSJ-1003-01-012, MR

CIRCUIT NO.	PART NO.	DESCRIPTION
Fuses		
F903, F904	252051	 6A (ST-6), Secondary

CIRCUIT NO.	PART NO.	DESCRIPTION
Holders		
F903a, F904a	250113	 SN5051, Fuse


POWER SUPPLY CIRCUIT PC BOARD (NAPS-3971-1)


CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q911	222780122	NEC 78M12
Q912	222790125	79M12
Q913	222780565	JRC 78M56
Transistors		
Q703, Q704	2213640	DTC123JS
Q914	2213830	DTB113ZS
Q915	2213074 or 2211455	2SA933-R or 2SA1015-GR
Q941	221282	DTC144ES
Q942	2213650	DTD113ZS
Q943	2213640	DTC123JS
Diodes		
D701	224450913	MTZ9.1C, Zener
D720-D722	223163	ISS133
D723	224450472	MTZ4.7B, Zener
D911-D917	22380035 or 22380032	GP104003E or 1SR139-100
D918	224453604	MTZ36D, Zener
D919, D939	22380035 or 22380032	GP104003E or 1SR139-100
D931-D936	22380032	1SR139-100
D937, D938	223163	ISS133
D941, D942	223163	ISS133
D943	224450913	MTZ9.1C
D944, D945	223163	ISS133
Power transformer		
T902	2300493	 NPT-1049D
Capacitors		
C701	354781009	10 μ F, 50V, Elect.
C707	354780479	4.7 μ F, 50V, Elect.
C708	354780109	1 μ F, 50V, Elect.
C901	3500065A	 DE7150FZ103PAC400V/125V, IS
C913	354753329	3300 μ F, 25V, Elect.
C914	354761029	1000 μ F, 35V, Elect.
C917, C918	354741009	10 μ F, 16V, Elect.
C919	354751029	1000 μ F, 25V, Elect.
C920	354741009	10 μ F, 16V, Elect.
C921, C923	354781019	100 μ F, 50V, Elect.
C922	354780229	2.2 μ F, 50V, Elect.
C924	354754719	470 μ F, 25V, Elect.
C932	354781019	100 μ F, 50V, Elect.
C933	354721019	100 μ F, 6.3V, Elect.
Resistors		
R901	431523355	 3.3Mohm, 1/2W, Solid
R911, R912	442524794	0.47ohm, 1/2W, Metal oxide film
R913	441722204	22ohm, 2W, Metal oxide film
R914	442524704	47ohm, 1/2W, Metal oxide film
R917	442523314	330 ohm, 1/2W, Metal oxide film
R918	441620334	3.3 ohm, 1W, Metal oxide film

CIRCUIT NO.	PART NO.	DESCRIPTION
R919	442521004	10ohm, 1/2W, Metal oxide film
R922	442522204	22ohm, 1/2W, Metal oxide film
R931	442520824	8.2 ohm, 1/2W, Metal oxide film
R934	441721514	150ohm, 2W, Metal oxide film
Relay		
RL901	25065248	 NRL-1P15A-DC12-29
Sockets		
JL901, JL902	25050272	NSCT-8P100
P903	2009990078	NSAS-4P0115
Fuse		
F901	252053	 8A (ST-6), Primary
Fuseholders		
F901a	250113	 SN5051, Fuse
Radiator		
	27160209	RAD-67

CIRCUIT NO.	PART NO.	DESCRIPTION
Labels		
F901b	29360842	8A/125V, Rating
F901c	29360626-1	Fuse

AC OUTLET TERMINAL PC BOARD (NAETC-3972-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
P902	25050388	 NSCT-6P215, AC outlet

NOTE:
THE COMPONENTS IDENTIFIED BY MARK  ARE
CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK.
REPLACE ONLY WITH PART NUMBER SPECIFIED.

PRINTED CIRCUIT BOARD PARTS LIST

PRE./MAIN AMPLIFIER PC BOARD (NAAF-3976-1)

CIRCUIT NO. PART NO. DESCRIPTION

ICs

Q301 22240191 NJM4565D-D
Q302-Q309 22240247 or BA15218N or
22240293 NJM4558L-D
Q310, Q313 22240339 LC7823N
Q311, Q312 22240280 LC7821N
Q501, Q502 22240311 μ PC1298V
Q541 22240311 μ PC1298V
Q851 22240211 μ PD6345C

Transistors

Q491-Q493 2213631 or RN1241-A or
2213632 RN1241-B
Q503, Q504 2211183 or 2SC1740-R or
Q542 2211255 2SC1815-GR
Q505, Q506 2201653, \star 2SC3856-O,
Q543 2201654 or \star 2SC3856-Y or
2201655 \star 2SC3856-P
Q507, Q508 2201663, \star 2SA1492-O,
Q544 2201664 or \star 2SA1492-Y or
2201665 \star 2SA1492-P

CAUTION: Replacement for transistor of mark \star , if necessary, must be made from the same beta group (HFE) as the original type.

2SC3856-O 2SA1492-O

Same beta group

Q531-Q534 2211732 or 2SC1845-F or
Q556 2211733 2SC1845-E
Q561 2211792 or 2SA992-F or
2211793 2SA992-E
Q801-Q805 2213631 or RN1241-A or
2213632 RN1241-B
Q852, Q855, Q856 2213510 DTA114ES
Q853 2213710 DTA123JS
Q854 221282 DTC114ES

Diodes

D501-D506 223163 1SS133
D851, D852 223163 1SS133
D901 22380038 RBV602

Coils

L501, L502 231176 S-1.3C
L541 231176 S-1.3C

Capacitors

C303, C304 391980227 2.2 μ F, 50V, Elect.
C307, C308 391921017 100 μ F, 6.3V, Elect.
C309, C310 374726224 6200pF, 5%, 50V, TF
C311, C312 374721824 1800pF, 5%, 50V, TF
C313, C314 391941007 10 μ F, 16V, Elect.
C317-C320 391941007 10 μ F, 16V, Elect.
C323-C326 391941007 10 μ F, 16V, Elect.
C331-C334 391941007 10 μ F, 16V, Elect.
C339-C342 391941007 10 μ F, 16V, Elect.
C347-C350 391941007 10 μ F, 16V, Elect.
C355-C358 391941007 10 μ F, 16V, Elect.
C361-C364 391941007 10 μ F, 16V, Elect.
C367-C370 391941007 10 μ F, 16V, Elect.
C371, C372 354744709 47 μ F, 16V, Elect.
C501, C502 391941007 10 μ F, 16V, Elect.
C503, C504 373303314 330pF, 5%, 125V, PP
C505, C506 354742219 220 μ F, 16V, Elect.
C511, C512 374726834 0.068 μ F, 5%, 50V, TF

CIRCUIT NO. PART NO.

C513, C514 374724734 0.047 μ F, 5%, 50V, TF
C517-C520 354700109 1 μ F, 160V, Elect.
C533 391921017 100 μ F, 6.3V, Elect.
C541 391941007 10 μ F, 16V, Elect.
C542 373303314 330pF, 5%, 125V, PP
C543 354742219 220 μ F, 16V, Elect.
C546 374726834 0.068 μ F, 5%, 50V, TF
C547 374724734 0.047 μ F, 5%, 50V, TF
C549, C550 354700109 1 μ F, 160V, Elect.
C562 354700109 1 μ F, 160V, Elect.
C851 391921017 100 μ F, 6.3V, Elect.
C855, C856 391941007 10 μ F, 16V, Elect.
C905, C906 3504240 12000 μ F, 63V, Elect.

Resistors

R509, R510 5210118 or N06HR 5KBC or
R545 5210062 N06HR 4.7KBD, Semi-fixed
R515-R516 442520824 8.2ohm, 1/2 W, Metal oxide film
R517, R518 441620824 8.2ohm, 1W, Metal oxide film
R519, R520 4500031 0.22ohm, 5W, Metal plate
R521, R522 442520824 8.2ohm, 1/2W, Metal oxide film
R523, R524 441620474 4.7ohm, 1W, Metal oxide film
R525-R528 442524794 0.47ohm, 1/2W, Metal oxide film
R529, R530 441623914 390ohm, 1W, Metal oxide film
R548 442520824 8.2ohm, 1/2W, Metal oxide film
R549 441620824 8.2ohm, 1W, Metal oxide film
R550 4500031 0.22ohm, 5W, Metal plate
R551 442520824 8.2ohm, 1/2W, Metal oxide film
R552 441620474 4.7ohm, 1W, Metal oxide film
R553, R554 442524794 0.47ohm, 1/2W, Metal oxide film

Relaies

RL501, RL502 25065339 NRL-2P5A-DC24-046
RL503 25065379 NRL-1P5A-DC24-058
RL504, RL505 25065339 NRL-2P5A-DC24-046
RL506 25065396 NRL-2P1.25A-DC24-067

Terminals

P301-P303 25045300 NPJ-6PDBL-159
P304 25045301 NPJ-8PDBL-160
P305 25045298 NPJ-2PDBL-157
P501 25060125 NTM-8PDMN058

Plugs

P511-P513 25055493 NPLG-2P468
P601-P603 25055492 NPLG-9P467

Sockets

P311 2000783 NSAS-6P739
P401 2000931 NSAS-6P884
JL301 25050273 NSCT-9P101
JL411 25050270 NSCT-6P98

Shield plate

27150309

Radiators

27160262

Clamps

27301186

Cord ass'y

P491 2065525300

HEADPHONE TERMINAL PC BOARD (NAETC-3978-1)**CIRCUIT NO. PART NO. DESCRIPTION**

CIRCUIT NO.	PART NO.	DESCRIPTION
P504	25045256	YKB21-5010, Headphone terminal

VIDEO TERMINAL PC BOARD (NAETC-3968-1)**CIRCUIT NO. PART NO. DESCRIPTION**

CIRCUIT NO.	PART NO.	DESCRIPTION
D381-D384	223163	1SS133, Diodes
P307	25045321	NPJ-3PDBL178, Terminal
P201a	25055132	NPLG-2P116, Plug
P311a	25055133	NPLG-3P117, Plug
P999	2061712100	Cord ass'y

REAR AMPLIFIER PC BOARD (NAAF-3979-1)**CIRCUIT NO. PART NO. DESCRIPTION**

CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q571, Q572	22240108	μ PC1225H
Transistors		
Q573, Q574	2211183 or 2211255	2SC1740-R or 2SC1815-GR
Q575, Q576	2202063, 2202064 or 2202066	\star 2SC4511-O, \star 2SC4511-Y or \star 2SC4511-P
Q577, Q578	2202053, 2202054 or 2202056	\star 2SA1725-O, \star 2SA1725-Y or \star 2SA1725-P

CAUTION: Replacement for transistor of mark \star , if necessary must be made from the same beta group (HFE) as the original type.

CIRCUIT NO. PART NO. DESCRIPTION

Ex. 2SC4511-O 2SA1725-O

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Same beta group

CIRCUIT NO.	PART NO.	DESCRIPTION
Q579, Q580	2211732 or 2211733	2SC1845-F or 2SC1845-E

Capacitors

CIRCUIT NO.	PART NO.	DESCRIPTION
C571, C572	391980227	2.2 μ F, 50V, Elect.
C575, C576	354741019	100 μ F, 16V, Elect.
C583, C584	374723334	0.033 μ F, 5%, 50V, TF
C585, C586	391980227	2.2 μ F, 50V, Elect.

Resistors

CIRCUIT NO.	PART NO.	DESCRIPTION
R589, R590	4500027	0.22ohm, 2W, Metal plate
R592	442520824	8.2ohm, 1/2W, Metal oxide film

Socket

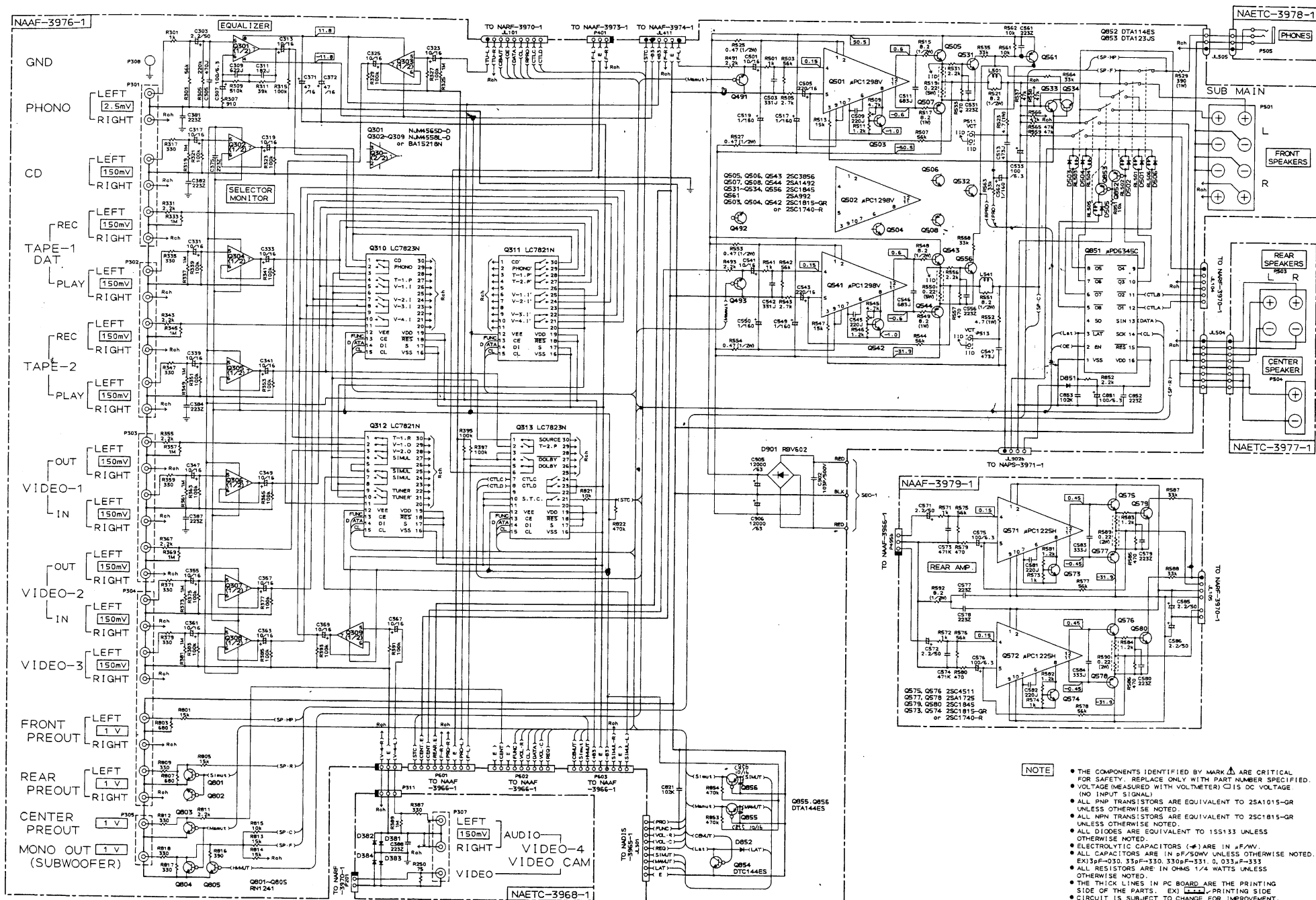
CIRCUIT NO.	PART NO.	DESCRIPTION
P495	2000562	NSAS-6P518

SPEAKER TERMINAL PC BOARD (NAETC-3977-1)**CIRCUIT NO. PART NO. DESCRIPTION**

CIRCUIT NO.	PART NO.	DESCRIPTION
P502	25060143	NTM-2PDML071, Terminal Center Speaker
P503	25060144	NTM-4PDML072, Terminal Rear Speaker

CHEMATIC DIAGRAM

AMPLIFIER SECTION



CONTROL SECTION



SURROUND CIRCUIT PC BOARD (NAAF-3966-1)

CIRCUIT NO. PART NO. DESCRIPTION

ICs

Q451, Q461	22240266	TC9213P
Q452, Q453	22240247 or	BA15218N or
Q462, Q601	22240293	NJM4558L-D
Q602	22240371	LA2775
Q603	22240279	LA2770
Q604-Q606	22240247 or	BA15218N or
	22240293	NJM4558L-D
Q661	22240370	M50198P
Q662	22240139	LA2730
Q665	222780053	78L05
Q693, Q694	22240270	LC7822N

Transistors

Q463, Q495	2213631 or	RN1241-A or
Q496	2213632	RN1241-B
Q663	221282	DTC144ES
Q664	2213510	DTA114ES
Q691, Q692	221282	DTC144ES

Diode

D661	223163	1SS133
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Coil

L661	233409K220	NCH-1284
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Ceramic osc

X661	3010169	CST3.27MGW002
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CIRCUIT NO. PART NO. DESCRIPTION

Capacitors

C451, C452	391980227	2.2μF, 50V, Elect.
C453, C454	391941007	10μF, 16V, Elect.
C455, C456	391980227	2.2μF, 50V, Elect.
C457, C458	391941007	10μF, 16V, Elect.
C461, C463	391980227	2.2μF, 50V, Elect.
C462	391941007	10μF, 16V, Elect.
C464, C465	354781099	0.1μF, 50V, Elect.
C466, C467	374721024	1000pF, 5%, 50V, TF
C468, C472	391941007	10μF, 16V, Elect.
C471	391980227	2.2μF, 50V, Elect.
C475, C476	354741019	100μF, 16V, Elect.
C601-C606	391941007	10μF, 16V, Elect.
C607	354741019	100μF, 16V, Elect.
C608	354721019	100μF, 6.3V, Elect.
C609-C611	374721034	0.01μF, 5%, 50V, TF
C613, C614	391941007	10μF, 16V, Elect.
C615-C618	354781099	0.1μF, 50V, Elect.
C621-C624	354783399	0.33μF, 50V, Elect.
C625-C628	392850477	4.7μF, 25V, LL
C629, C630	374726824	6800pF, 5%, 50V, TF
C631, C632	354744709	47μF, 16V, Elect.
C633, C634	354782299	0.22μF, 50V, Elect.
C635, C636	392850477	4.7μF, 25V, LL
C637, C638	354782299	0.22μF, 50V, Elect.
C639	354744709	47μF, 16V, Elect.
C640	374721044	0.1μF, 5%, 50V, TF
C641, C642	391941007	10μF, 16V, Elect.
C643	391980227	2.2μF, 50V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
C644, C646	391941007	10 μ F, 16V, Elect.
C647	374722224	2200pF, 5%, 50V, TF
C648	391941007	10 μ F, 16V, Elect.
C653, C654	391941007	10 μ F, 16V, Elect.
C657	391941007	10 μ F, 16V, Elect.
C659, C660	391941007	10 μ F, 16V, Elect.
C661	354780109	1 μ F, 50V, Elect.
C662	374725624	5600pF, 5%, 50V, TF
C664, C668	374721044	0.1 μ F, 5%, 50V, TF
C665	354744709	47 μ F, 16V, Elect.
C666, C667	354784799	0.47 μ F, 50V, Elect.
C669	374725624	5600pF, 5%, 50V, TF
C671	391941007	10 μ F, 16V, Elect.
C672	391921017	100 μ F, 6.3V, Elect.
C673, C674	374721044	0.1 μ F, 5%, 50V, TF
C675	391941007	10 μ F, 16V, Elect.
C676	374721034	0.01 μ F, 5%, 50V, TF
C677	354780109	1 μ F, 50V, Elect.
C678	391941007	10 μ F, 16V, Elect.
C679	374728224	8200pF, 5%, 50V, TF
C680	374724724	4700pF, 5%, 50V, TF
C681	374722734	0.027 μ F, 5%, 50V, TF
C682	354742209	22 μ F, 16V, Elect.
C683	354741019	100 μ F, 16V, Elect.
C684	354780109	1 μ F, 50V, Elect.
C685	374723334	0.033 μ F, 5%, 50V, TF
C686	354781099	0.1 μ F, 50V, Elect.
C687	354783399	0.33 μ F, 50V, Elect.
C688	354741019	100 μ F, 16V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
C689	391980227	2.2 μ F, 50V, Elect.
C691	354784799	0.47 μ F, 50V, Elect.
C692-C696	391941007	10 μ F, 16V, Elect.

Plug

P495a	25055133	NPLG-3P117
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Sockets

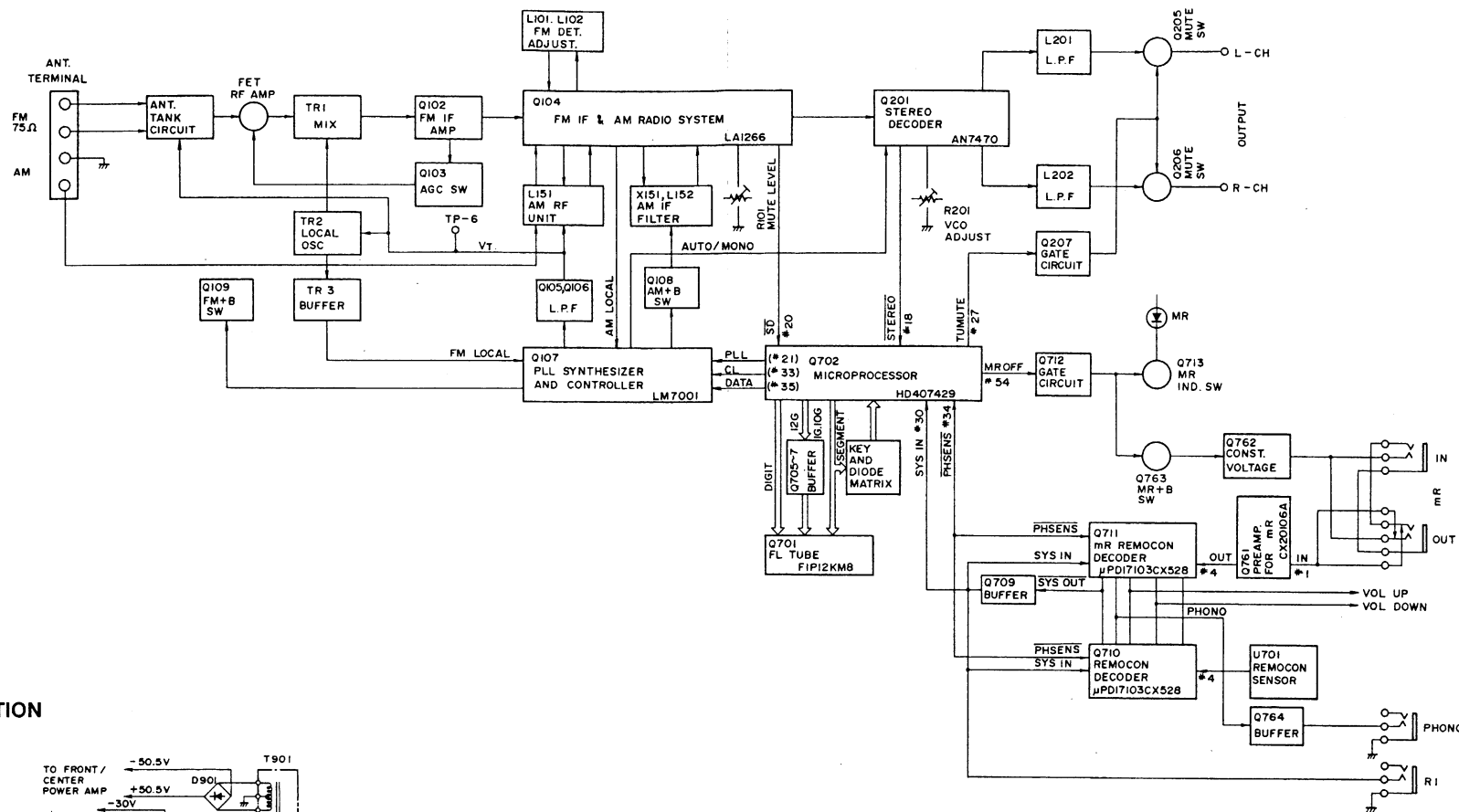
P601a-P603a	25050442	NSCT-9P266
P611	2000799	NSAS-6P755

Shield wire

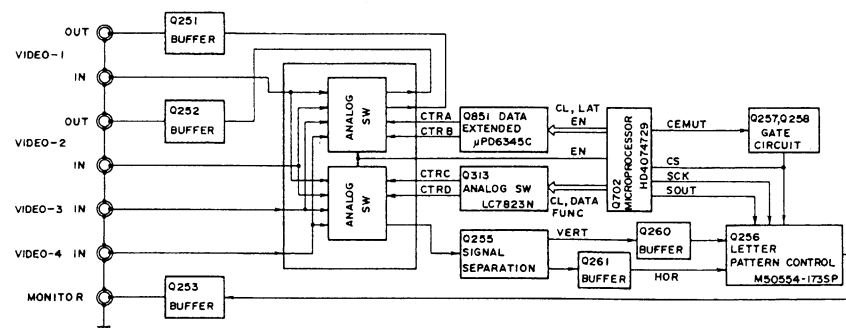
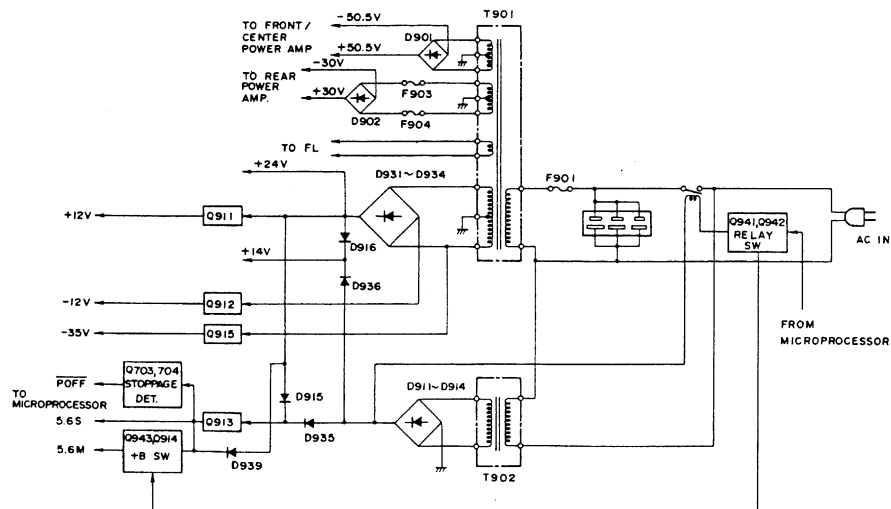
P451	2050031	NCS-8P3E40
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MASTER VOLUME PC BOARD (NAAF-3973-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
IC		
Q841	22240372	BA6208
Capacitor		
C841	354721019	100 μ F, 6.3V, Elect.
Resistor		
R401, R402	5140002	N16RGL50KA30F, Variable,
R407-R409		Master Volume

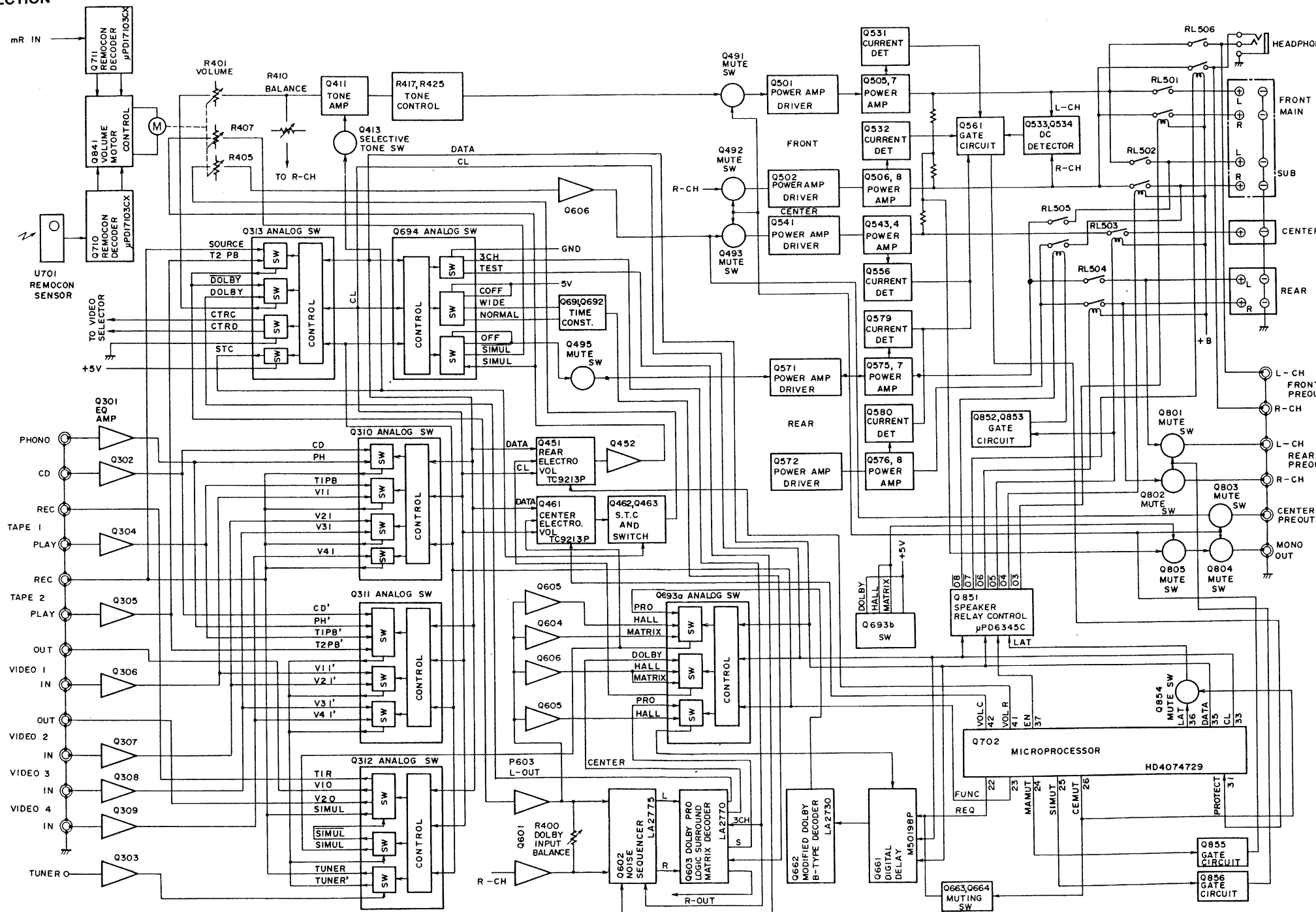


VIDEO SECTION



CK DIAGRAM

IFIER SECTION



CIRCUIT NO.	PART NO.	DESCRIPTION
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	Plug	
P401a	25055133	NPLG-3P117

	Sockets	
JL451	25050272	NSCT-8P100
JL701	25050269	NSCT-5P97
P841	2000635A	NSAS-4P591

VOLUME INDICATOR PC BOARD (NADIS-3975-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
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D841	225241 or 225242 27190545	SEL2210R-C or SEL2210R-D, L.E.D Holder, LED
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TONE CONTROL CIRCUIT PC BOARD (NAAF-3974-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
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	IC	
Q411	22240191	NJM4565D-D

	Transistors	
Q413, Q414	2213631 or 2213632	RN1241-A or RN1241-B

	Capacitors	
C411, C412	391980227	2.2 μ F, 50V, Elect.
C415, C416	391941007	10 μ F, 16V, Elect.
C417, C418	374723334	0.033 μ F, 5%, 50V, TF
C419, C420	374723344	0.33 μ F, 5%, 50V, TF
C423, C424	374724724	4700pF, 5%, 50V, TF
C425, C426	374723934	0.039 μ F, 5%, 50V, TF
C427, C428	391980227	2.2 μ F, 50V, Elect.
C429-C432	354781099	0.1 μ F, 50V, Elect.
C433-C436	374721024	1000pF, 5%, 50V, TF
C437, C438	354744709	47 μ F, 16V, Elect.

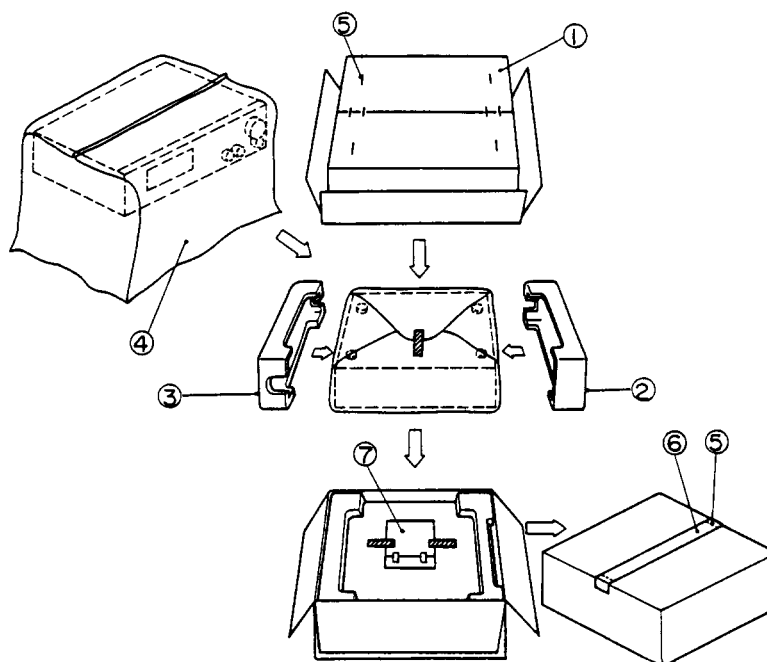
	Resistors	
R405	5104225	N11RGLC250KWT22Z, Variable, BALANCE
R417, R418	5104216	N14RLC50KC22Z, Variable, BASS
R425, R426	5104216	N14RLC50KC22Z, Variable, TREBLE

INPUT BALANCE VOLUME PC BOARD (NAETC-3967-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
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R410	5104258	N11RGLC250KWT15Z, Variable resistor
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PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29052103	Master carton box
2	29091422A	Pad L
3	29091423A	Pad R
4	29100035A	1020×720, Poly-styrene bag
5	282301	Sealing hook
6	29110071-1	Damplon tape
7	Accessory bag ass'y	
	29341554A	Instruction manual
	29100097	250×350, Poly-styrene bag
	292064B	FM antenna
	232140	NMA-3057, AM loop antenna
	3010054	UM-3, Two batteries
	24140185	RC-AV70M, Remote control transmitter
	2010200	Remote control cord
	29365019	Warranty card
	29358002J	Service station list

ONKYO CORPORATION

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